

REMARKS

Rejection of Claims 1-34 under 35 USC 103(a)

The Examiner rejects Claims 32-41 as being obvious in view of U.S. Patent 4,776,661 (Handa) combined with of U.S. Patent 5,874,362 (Wong).

Independent Claim 1 and 19 are directed to a method of forming an optical component. The method includes applying an etching medium to a light transmitting medium to form one or more waveguide surfaces in the light transmitting medium. Independent Claim 1 and 19 each specify that "the etching medium include(es) a fluorine containing gas and one or more partial passivants."

A prima facie case of obviousness is not established unless, "there (is) some suggestion or motivation ... to modify the references or combine reference teachings." See MPEP 706.02(j). The abstract of Handa indicates that the patent is directed to "an integrated optical device." In contrast, Wong is directed to etching of integrated circuits (ICs). See column 1, lines 27-47 and column 2, line 10-12, etc. Because Wong does not teach or suggest that the disclosed etching technology is suitable for use in fabricating optical components, there is no suggestion to combine the references and the prima facie case of obviousness is not established.

Further, a prima facie case of obviousness is not established unless "there (is) a reasonable expectation of success" when combining the references. See MPEP 706.02(j). Because light signals scatter undesirably when incident on a rough surface, waveguide surfaces have stringent smoothness requirements. These smoothness requirements exceed the smoothness requirements associated with integrated circuit fabrication. For instance, waveguide smoothness requirements are often one or more orders of magnitude higher than IC smoothness requirements. As a result, there is an expectation that integrated circuit etches will not be successful when applied to waveguide fabrication. Because Wong is directed to IC fabrication, there is a negative expectation of success associated with applying the Wong technology to waveguide fabrication. As a result, these references are improperly combined and the prima facie case of obviousness is not established.

Rejection of Claims 9-11, 15 - 17, 29, 30 and 33-35 under 35 USC 103(a)

The Examiner states that claims 7-9, 13 - 15, 24, 25 and 28-30 differ from Wong and Handa. The examiner describes these claims as "specifying various compositions and process conditions for the etching process." The Examiner rejects these claims stating that "same were known to be cause effective variables and routine experimentation would have been expected to optimize them." Wong states that there "are a number of process variables ... such as the choice of chemistry, pressure, flowrates, etc. The complicated effects of these interdependent variables makes it difficult to achieve reproducible control of trench profile, etch rate and other characteristics." See column 2, lines 2-7. As a result, the text of the Wong reference contradicts the assertion that the claimed etch variables are not "known to be cause effective."

The Examiner also rejects claims 7-9, 13 - 15, 24, 25 and 28-30 because "changes in temperature, concentrations or other conditions of an old process, do not impart patentability unless the recited changes ... produce a new and unexpected result." Because the references are not properly combined, the claims are not directed to an "old process."

Rejection of Claims 2, 23 and 38 under 35 USC 103(a)

The Examiner rejects Dependent Claims 2, 23 and 38 as being obvious in view of U.S. Patent 4,776,661 (Handa) combined with of U.S. Patent 6,235,214 (Deshmukh).

The abstract of Handa indicates that the patent is directed to "an integrated optical device." In contrast, Deshmukh is directed to etching of integrated circuits. See column 1, lines 20-30, etc. Because Deshmukh does not teach or suggest that the disclosed etching technology is suitable for use in fabricating optical components, there is no suggestion to combine the references and a prima facie case of obviousness is not established.

Further, Deshmukh is directed to providing IC etches having an increased etch rate, photoresist selectivity and profile control. See col 1, line 46 and col. 4, lines 60-62. As noted above, there is an expectation that an integrated circuit etches will not be successful when applied to waveguide fabrication. Because Deshmukh is directed to IC fabrication, there is a negative expectation of success associated with applying the Deshmukh technology to waveguide fabrication. As a result, these references are improperly combined and the prima facie case of obviousness is not established.

Rejection of Claims 3 and 24 under 35 USC 103(a)

The Examiner rejects Dependent Claims 3 and 24 as being obvious in view of U.S. Patent 4,776,661 (Handa) combined with of U.S. Patent Application Publication US 2001/0001652 (Kanno).

Dependent Claim 3 and 24 are directed to a method of forming an optical component. The method includes applying an etching medium to a light transmitting medium to form one or more waveguide surfaces in the light transmitting medium. The etching medium includes a fluorine containing gas and one or more partial passivants. Dependent Claims 3 and 24 each specify that "the fluorine containing gas includes SF₆ and the partial passivant includes C₄F₈.

Kanno is directed to "a process for efficient decomposition treatment of a gas containing fluorine compounds." See column 1, lines 2-5. Kanno teaches that SF₆ and C₄F₈ can be used as etchants. However, Kanno does not teach an etching medium that includes both SF₆ and C₄F₈. As a result, the combination of Handa and Kanno does not teach each element of Dependent Claims 3 and 24 and the rejection should be withdrawn.

CONCLUSION

In light of the Amendments and arguments set forth above, Applicants believe they are entitled to a letters patent. The Examiner is encouraged to telephone the undersigned with any questions.

Respectfully submitted

Date:

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TRAVIS DODD
Reg. No. 42,491

Law Offices of Travis L. Dodd
A Professional Corporation
2490 Heyneman Hollow
Fallbrook, CA 92028
Telephone: (760) 731-3091
Fax: (760) 728-1541
E-mail: LISDodd@aol.com



VERSION WITH MARKINGS SHOWING CHANGES MADE

IN THE SPECIFICATION

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Please amend the first paragraph as follows:

This application is a continuation-in-part of U.S. Patent application serial number 09/845,093 filed on [April 30, 2001] April 27, 2001 entitled "Formation of an Optical Component Having Smooth Sidewalls" and incorporated herein in its entirety. This application is also a continuation-in-part of U.S. Patent application serial number 09/932,253 filed on August 16, 2001 and entitled "Formation of an Optical Component"